Fig. 1

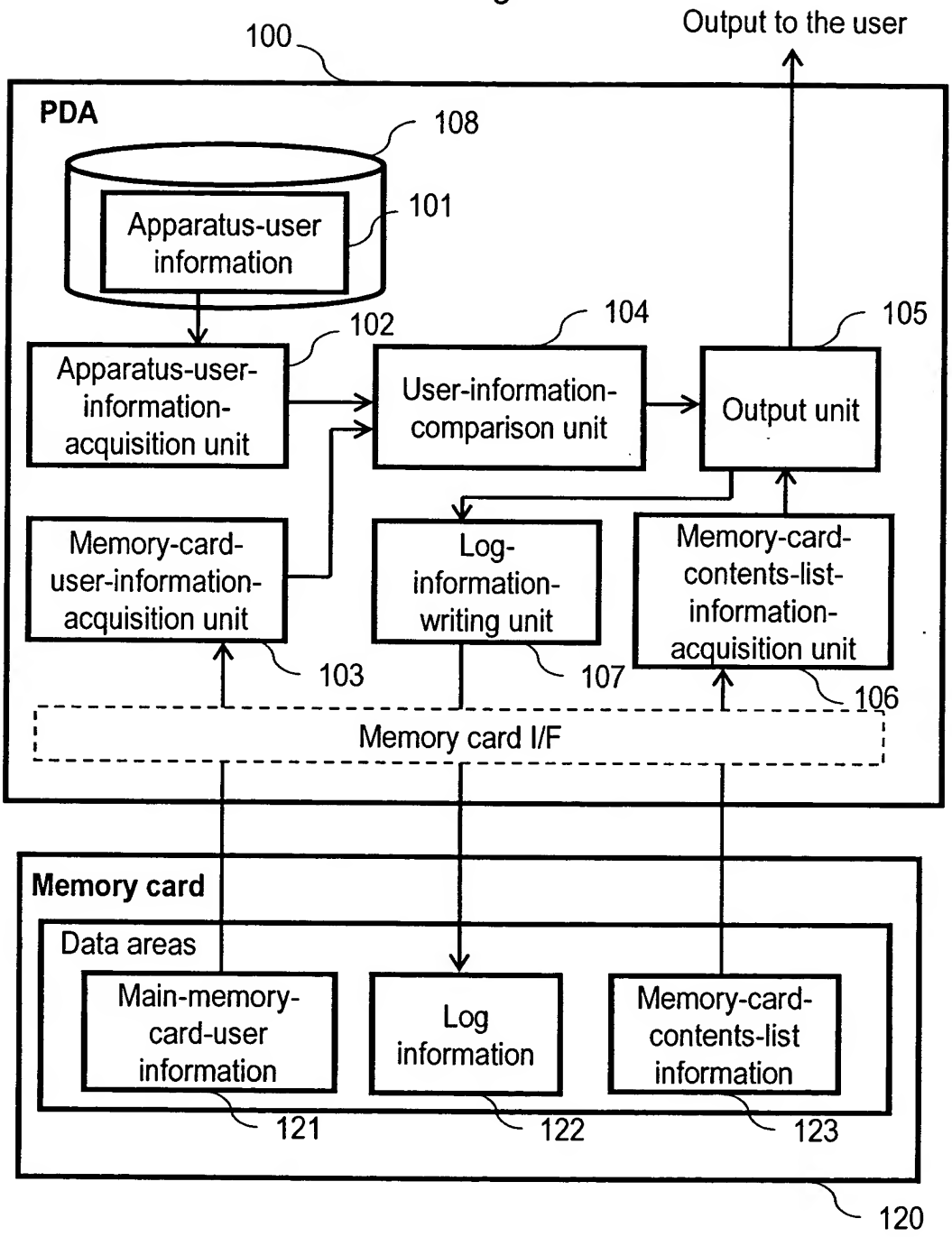

Output to the user
100
PDA
108
Apparatus-user information
101
102
104
105
Apparatus-user-information-acquisition unit
User-information-comparison unit
Output unit
Memory-card-user-information-acquisition unit
Log-information-writing unit
Memory-card-contents-list-information-acquisition unit
103
107
106
Memory card I/F
Memory card
Data areas
Main-memory-card-user information
Log information
Memory-card-contents-list information
121
122
123
120

Fig. 2

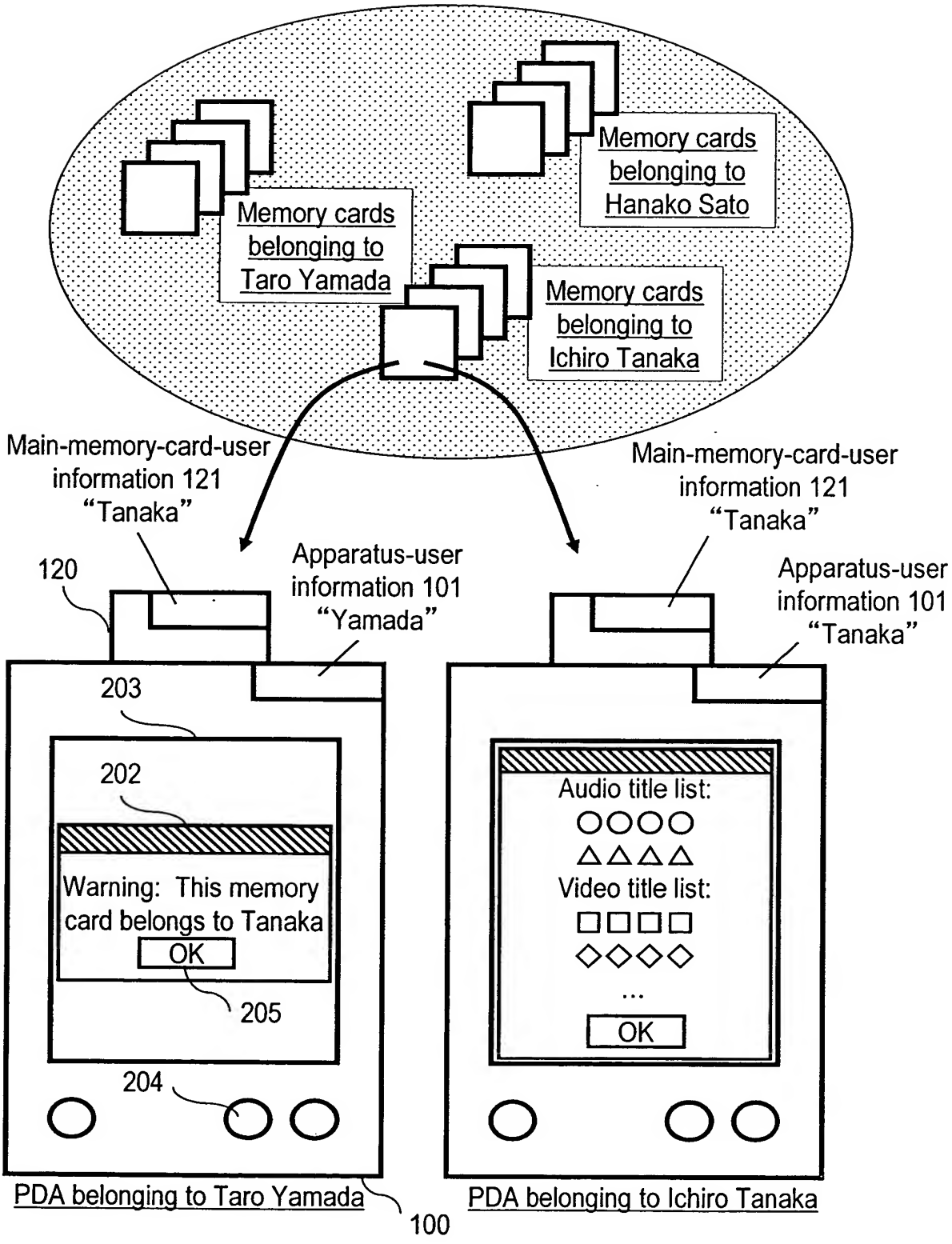

Memory cards belonging to Hanako Sato
Memory cards belonging to Taro Yamada
Memory cards belonging to Ichiro Tanaka
Main-memory-card-user information 121 "Tanaka"
Main-memory-card-user information 121 "Tanaka"
120
Apparatus-user information 101 "Yamada"
Apparatus-user information 101 "Tanaka"
203
202
Warning: This memory card belongs to Tanaka
OK
205
204
Audio title list:
Video title list:
...
OK
PDA belonging to Taro Yamada
PDA belonging to Ichiro Tanaka
100

Fig. 3

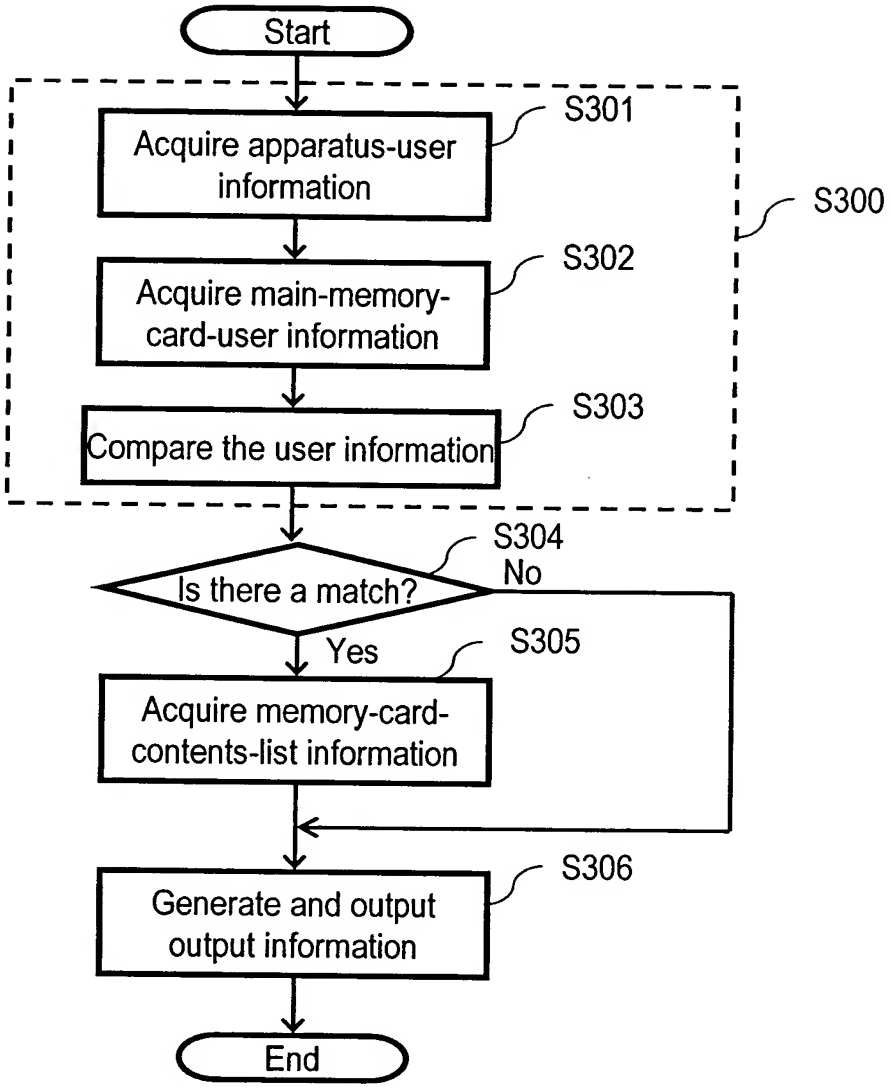

Start
S301
Acquire apparatus-user information
S300
S302
Acquire main-memory-card-user information
S303
Compare the user information
S304
No
Is there a match?
Yes
S305
Acquire memory-card-contents-list information
S306
Generate and output output information
End

Fig. 4A

Apparatus-user information, main-memory-card-user information

401

402

Data type	Byte(s)
User ID	4
User name	64

Fig. 4B

Sub-memory-card-user information

Data type	Byte(s)
Number of usable user IDs	4
User ID	4
User ID	4
....	....
User ID	4

405

406

Amount of usable user IDs

Fig. 5

Data type	Byte(s)	Value	Explanation
Comparison result	4	0 = MATCH 1 = UNMATCH 2 = NOTHING	Match No match No user information

Fig. 6A

Data Structure (List Information)

Memory-card-contents-list information

Data type	Byte(s)
Number of file types	4
File-list information	68~
File-list information	68~
....	....
File-list information	68~

601

602

Lists for all file types

Fig. 6B

Data Structure (List Information)

File-list information

602

Data type	Byte(s)
File-type name	64
Number of files	4
File name	128
File name	128
....	....
File name	128

603

604

605

Amount of files

Fig. 7A

Apparatus-user information

Data type	Value
User ID	0120
User name	"Yamada"

Fig. 7B

Apparatus-user information

Data type	Value
User ID	0120
User name	
E-mail address	"yamada@saijo.xx.jp"
Address information	"1-1-1 Saijo, Hiroshima City"

Fig. 8A

Main-memory-card-user information

Data type	Value
User ID	0124
User name	"Tanaka"

Fig. 8B

Main-memory-card-user information

Data type	Value
User ID	0120
User name	"Yamada"

Fig. 8C

Main-memory-card-user information

Data type	Value
User ID	0124
User name	"Tanaka"
E-mail address	"tanaka@saijo.xx.jp"

801

Fig. 9A

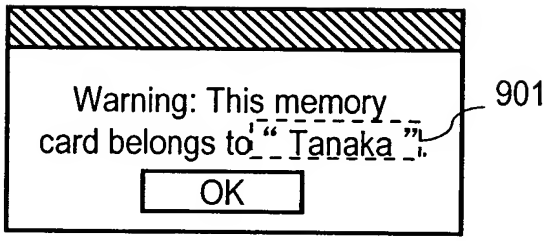

Warning: This memory
card belongs to " Tanaka ".
OK
901

Fig. 9B

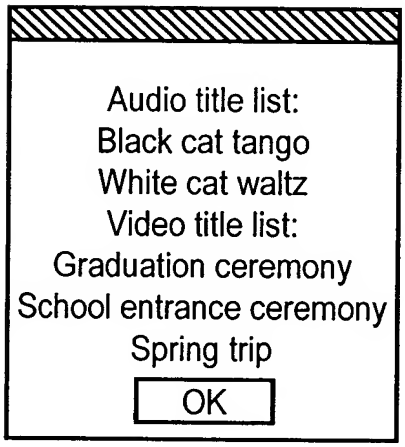

Audio title list:
Black cat tango
White cat waltz
Video title list:
Graduation ceremony
School entrance ceremony
Spring trip
OK

Fig. 10

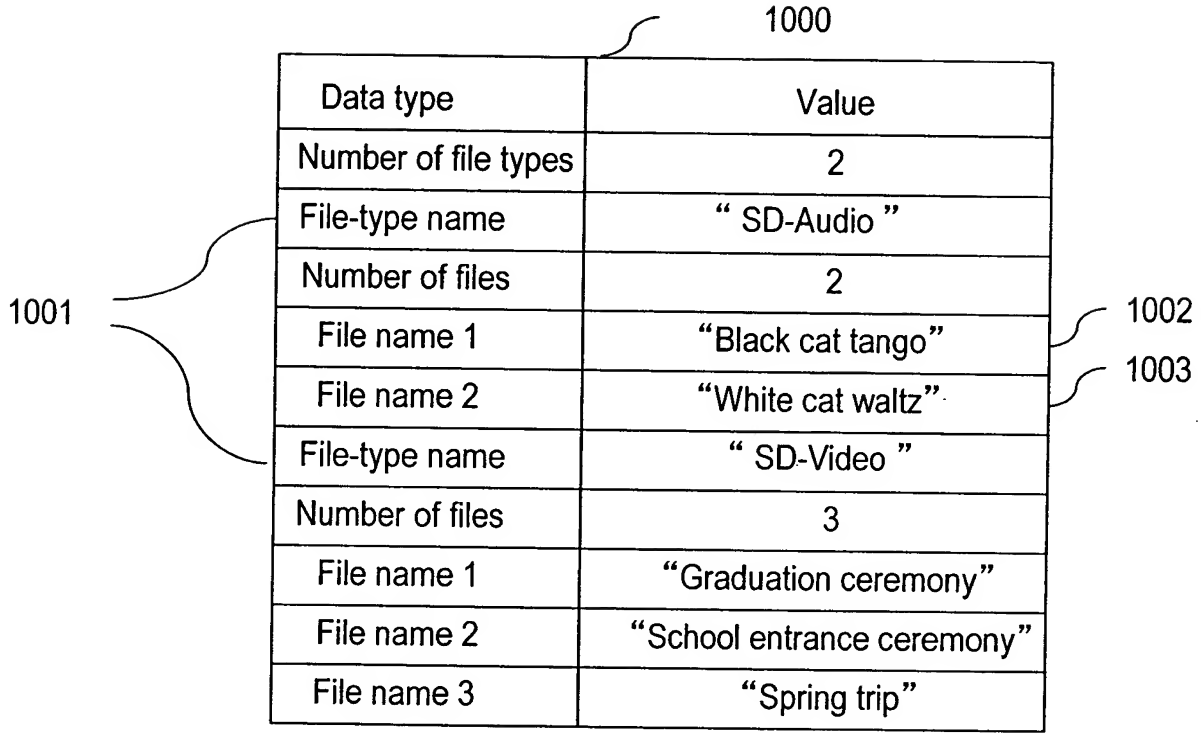

1000
Data type
Value
Number of file types
2
File-type name
" SD-Audio "
Number of files
2
File name 1
"Black cat tango"
File name 2
"White cat waltz"
File-type name
" SD-Video "
Number of files
3
File name 1
"Graduation ceremony"
File name 2
"School entrance ceremony"
File name 3
"Spring trip"
1001
1002
1003

Fig. 11

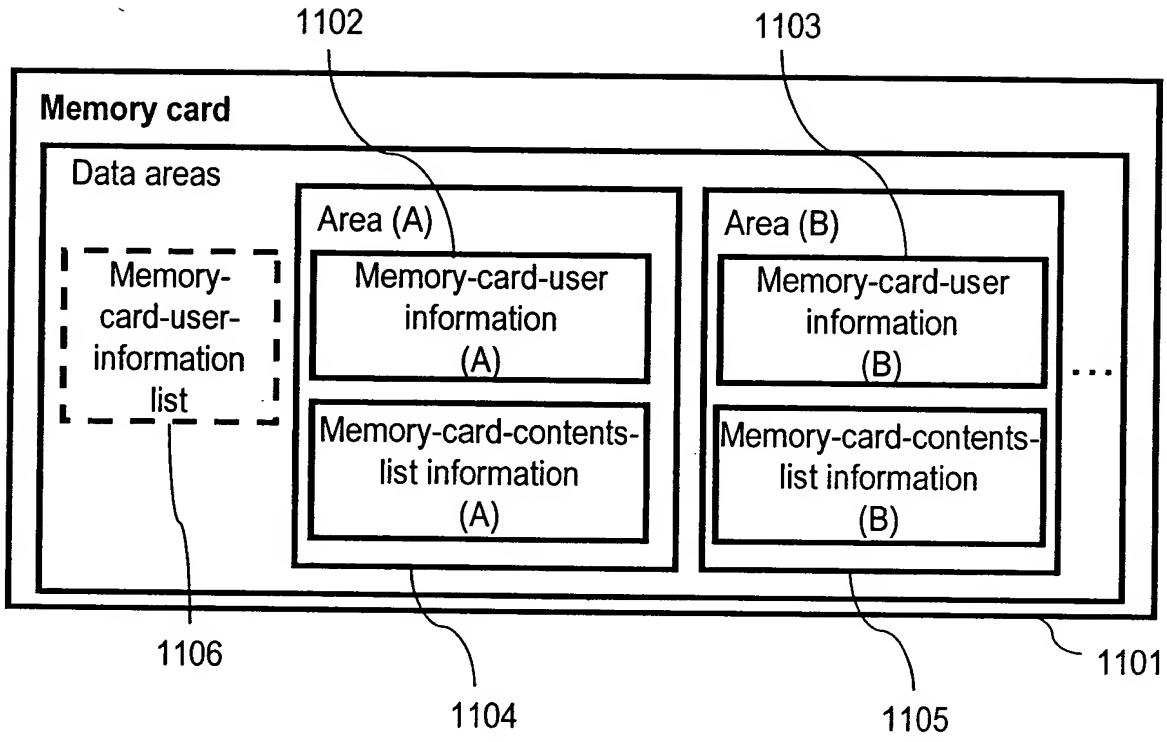

1102
1103
Memory card
Data areas
Memory-card-user-information list
Area (A)
Memory-card-user information (A)
Memory-card-contents-list information (A)
Area (B)
Memory-card-user information (B)
Memory-card-contents-list information (B)
1106
1104
1105
1101

Fig. 12

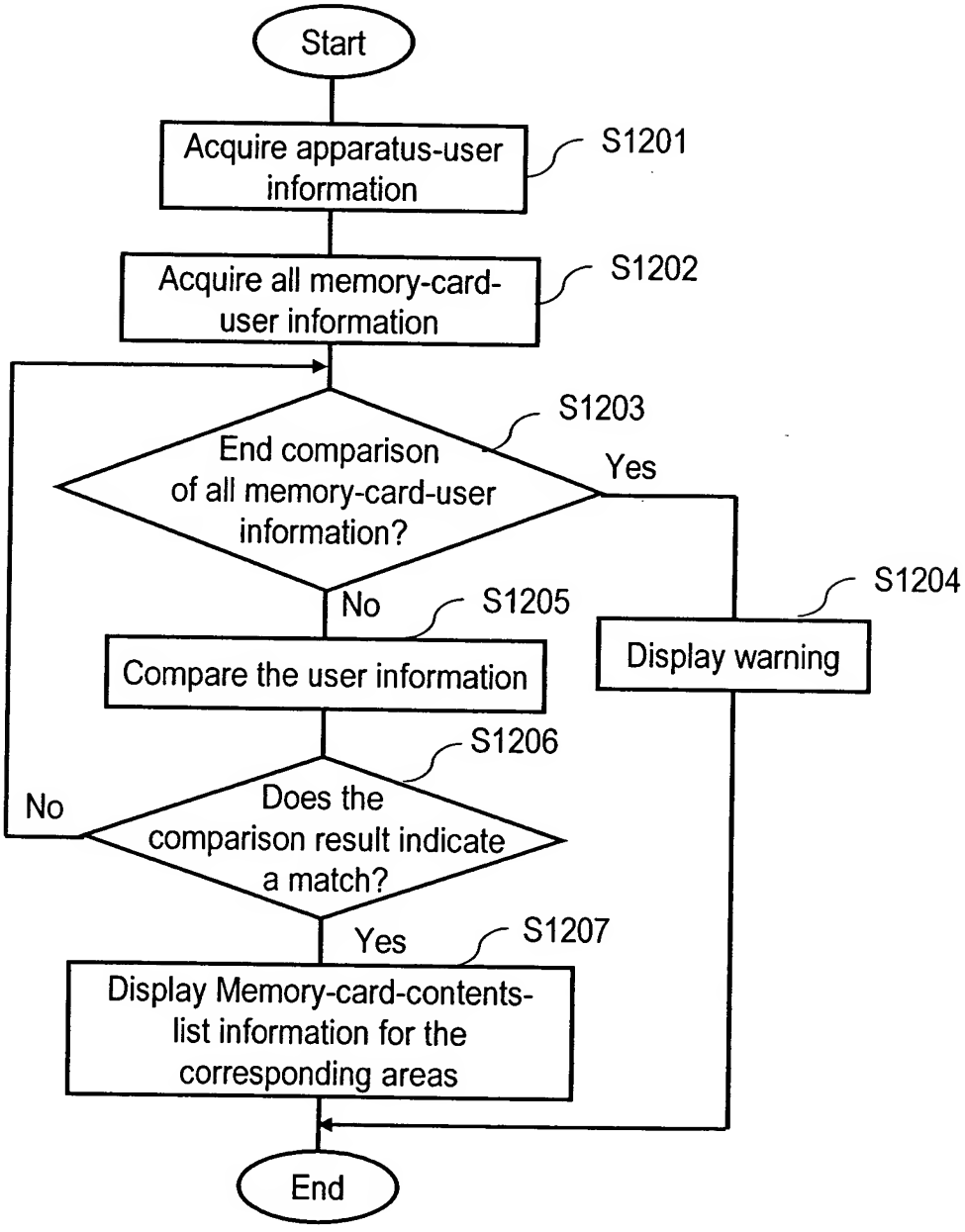

Start
Acquire apparatus-user information
S1201
Acquire all memory-card-user information
S1202
End comparison of all memory-card-user information?
S1203
Yes
No
S1205
Compare the user information
S1204
Display warning
Does the comparison result indicate a match?
S1206
No
Yes
S1207
Display Memory-card-contents-list information for the corresponding areas
End

Fig. 13

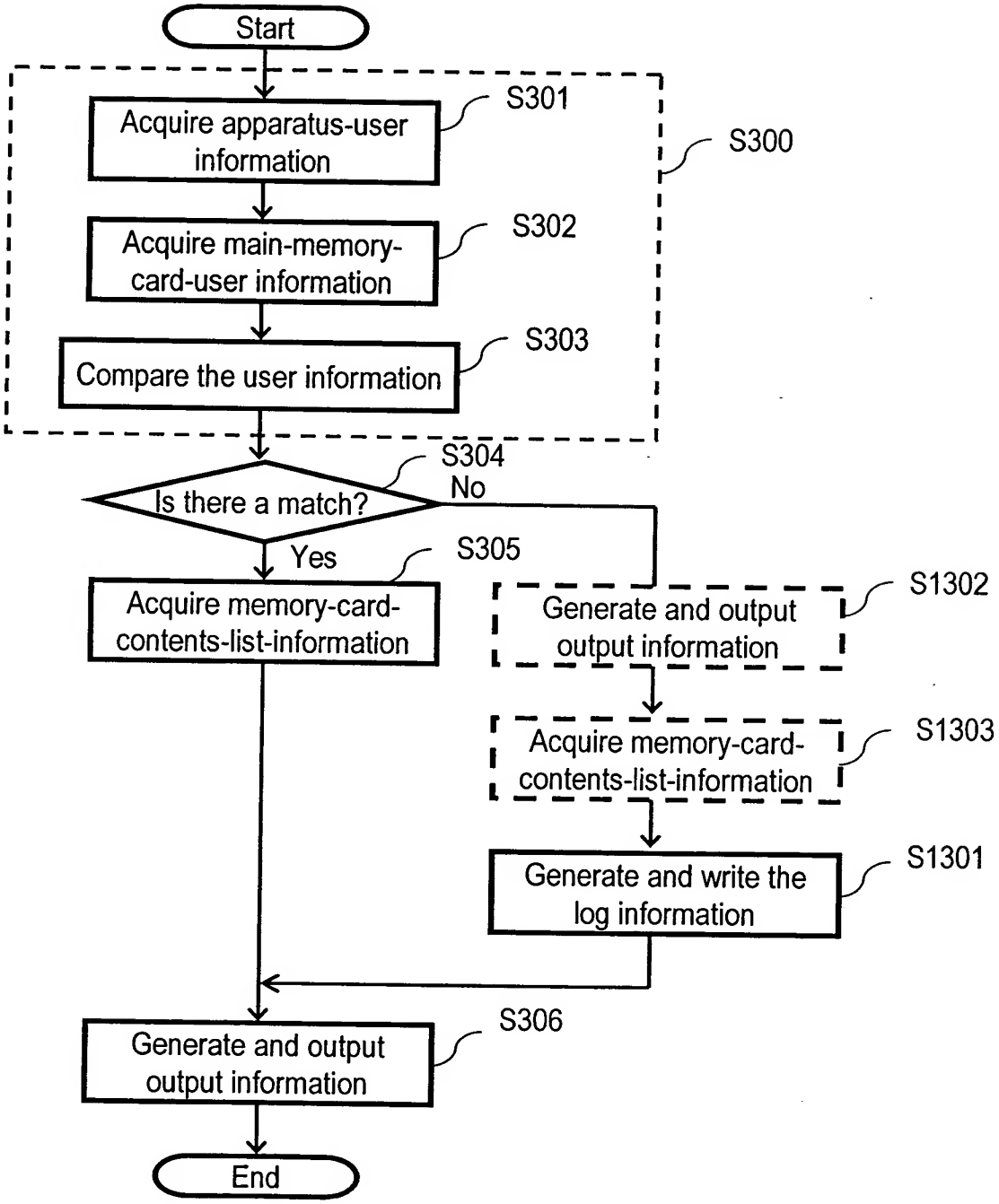

Start
S300
S301
Acquire apparatus-user information
S302
Acquire main-memory-card-user information
S303
Compare the user information
S304
Is there a match?
No
Yes
S305
Acquire memory-card-contents-list-information
S1302
Generate and output output information
S1303
Acquire memory-card-contents-list-information
S1301
Generate and write the log information
S306
Generate and output output information
End

Fig. 14A

Memory-card-user information: 1401

Data type	Byte(s)
User ID	4
User name	64
Date/time of use	128

1402
1403
1404

Fig. 14B

Log information: 122

Data type	Byte(s)
Number of memory card users	4
Memory-card-user information	196
....	....
Memory-card-user information	196

1405
1401
Amount of memory card user

Fig. 15A

Memory-card-user information

Data type	Value
User ID	0120
User name	"Yamada"
Date/time of use	"2002 / 3 / 8 14:00"

Fig. 15B

Log information

Data type	Value
Number of memory card users	2
User ID	0122
User name	"Sato"
Date/time of use	"2002 / 3 / 1 10:30"
User ID	0120
User name	"Yamada"
Date/time of use	"2002 / 3 / 8 14:00"

1503

1501

1502

Fig. 16A

Memory-card-user information: 1601

Data type	Byte(s)	
User ID	4	1402
User name	64	1403
Date/time of use	128	1404
Start address of referenced-contents information	4	1602

Fig. 16B

Referenced-contents information: 1603

Data type	Byte(s)	
File name	128	1604
File type name	64	1605
Date/time of last use	128	1606
Number of time referenced	4	1607
Start address of next referenced-contents information	4	1608

Fig. 17A

Log information

Data type	Value
Number of memory-card users	2
User ID	0122
User name	"Sato"
Date/time of use	"2002 / 3 / 1 10:30"
Start address of referenced-contents information	1010
User ID	0120
User name	"Yamada"
Date/time of use	"2002 / 3 / 8 14:00"
Start address of referenced-contents information	1001

1503, 1501, 1701, 1502, 1702

Fig. 17B

Referenced-contents information

Start address 1001

1703

	Data type	Value
1704	File name	"White Cat Waltz"
1705	File type name	"SD-Audio "
1706	Date/time of last use	"2002/3/1 09:15"
1707	Number of times referenced	2
1708	Start address of next referenced-contents information	1002

Start address 1002

Data type	Value
File name	"Spring Trip"
File type name	"SD-Video"
Date/time of last use	"2002/3/1 10:00"
Number of times referenced	100
Start address of next referenced-contents information	NULL

Fig. 18A

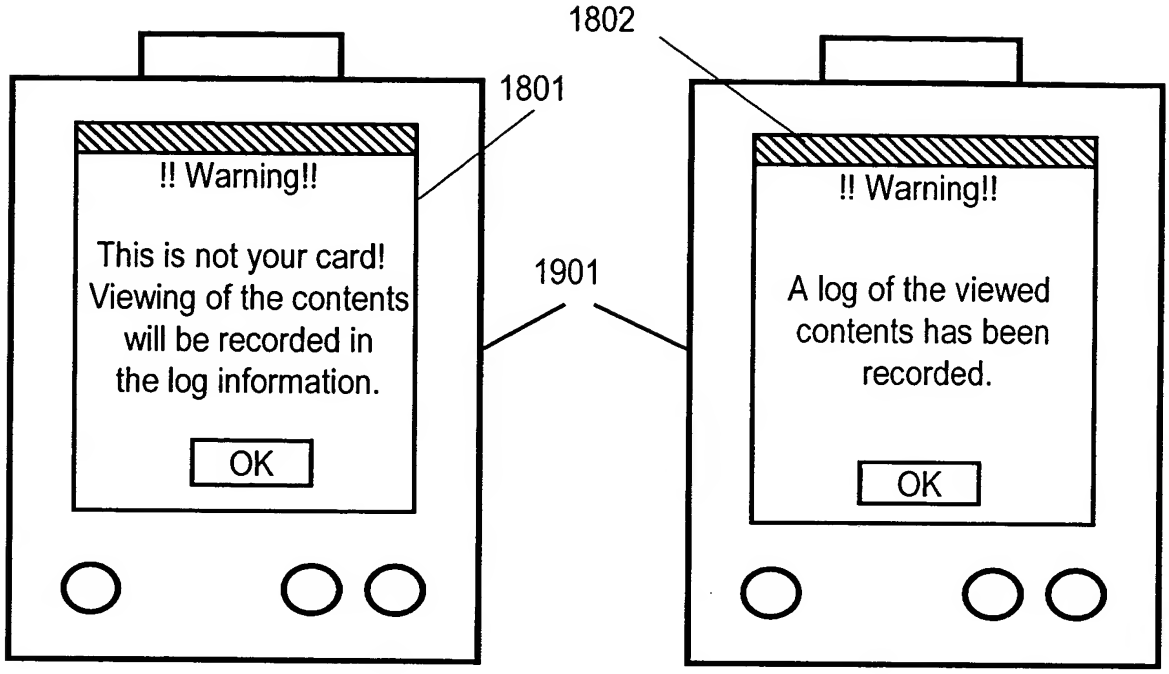


Fig. 18B

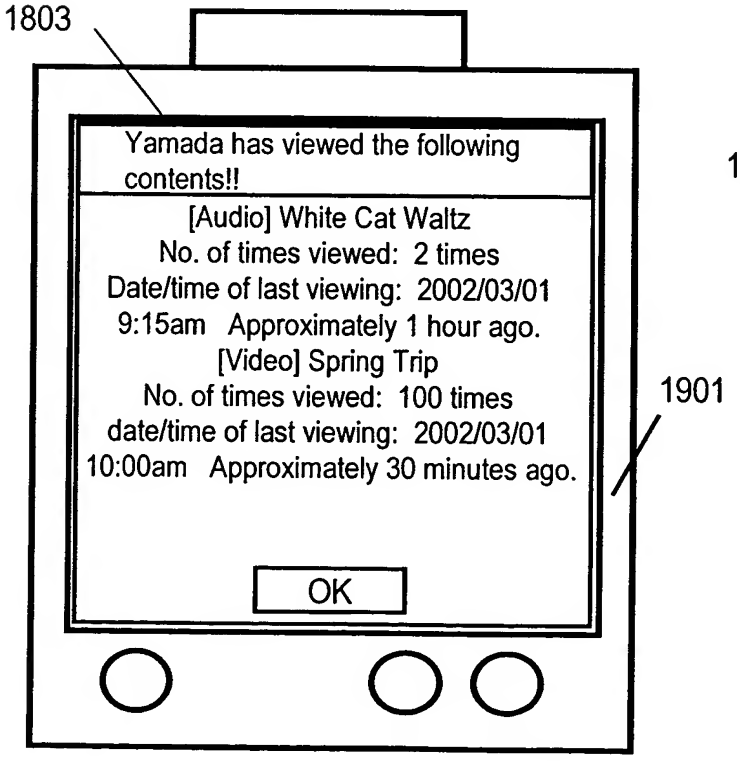


Fig. 18C

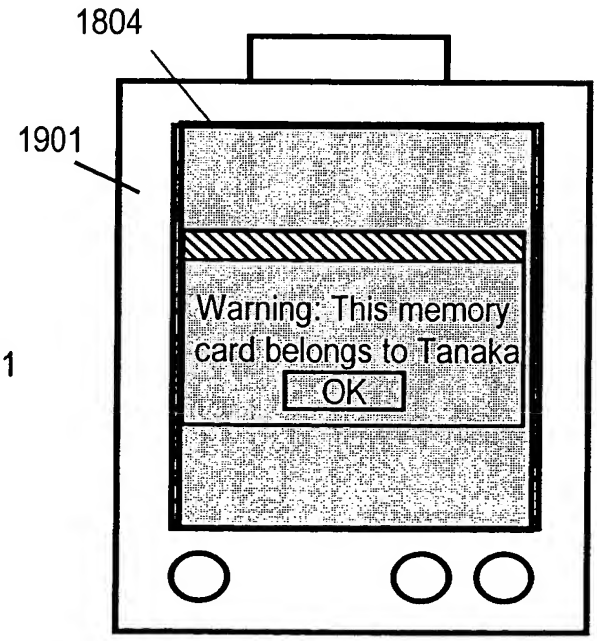


Fig. 19

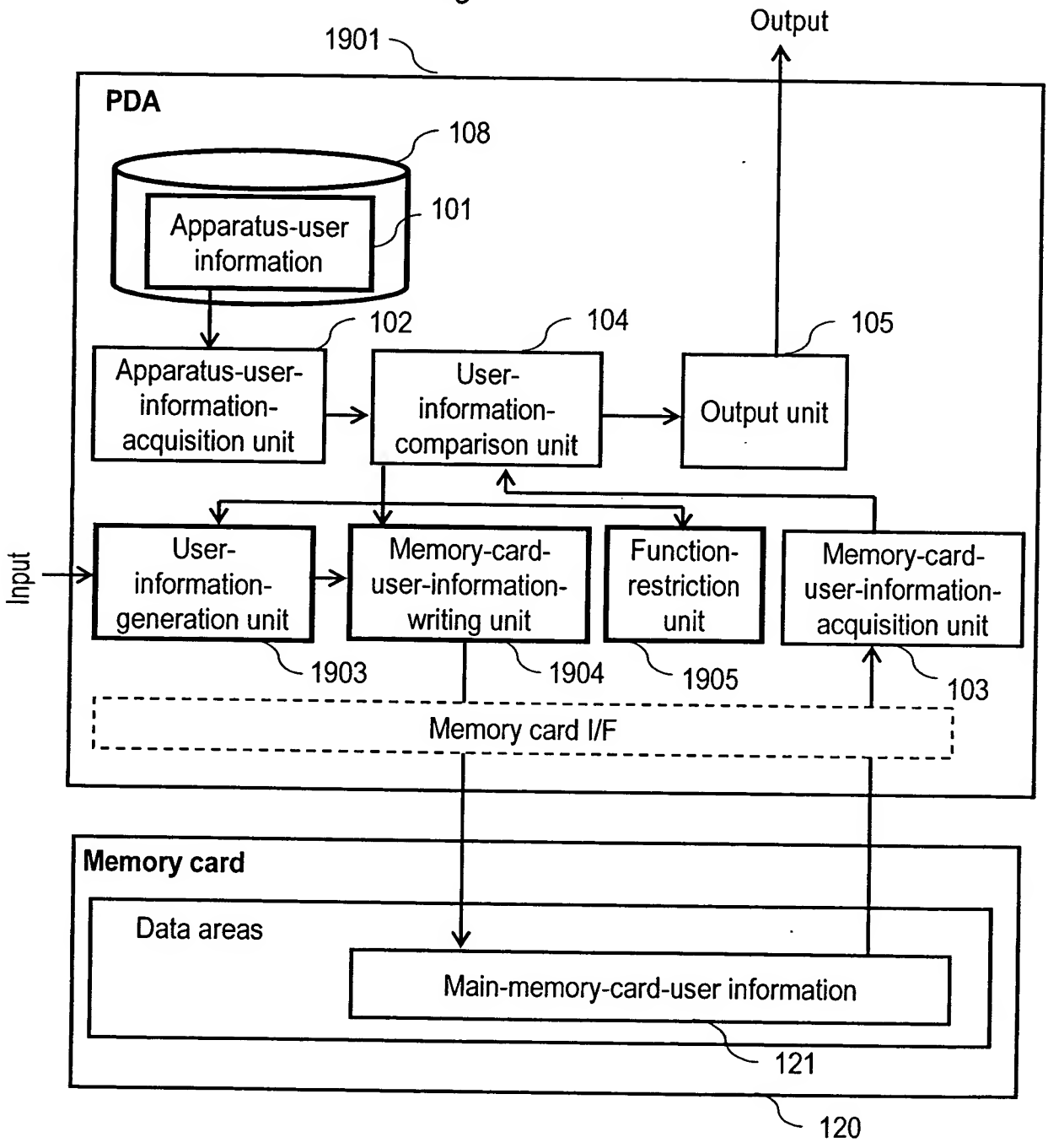

1901
Output
PDA
108
Apparatus-user information
101
102
104
105
Apparatus-user-information-acquisition unit
User-information-comparison unit
Output unit
Input
User-information-generation unit
Memory-card-user-information-writing unit
Function-restriction unit
Memory-card-user-information-acquisition unit
1903
1904
1905
103
Memory card I/F
Memory card
Data areas
Main-memory-card-user information
121
120

Fig. 20

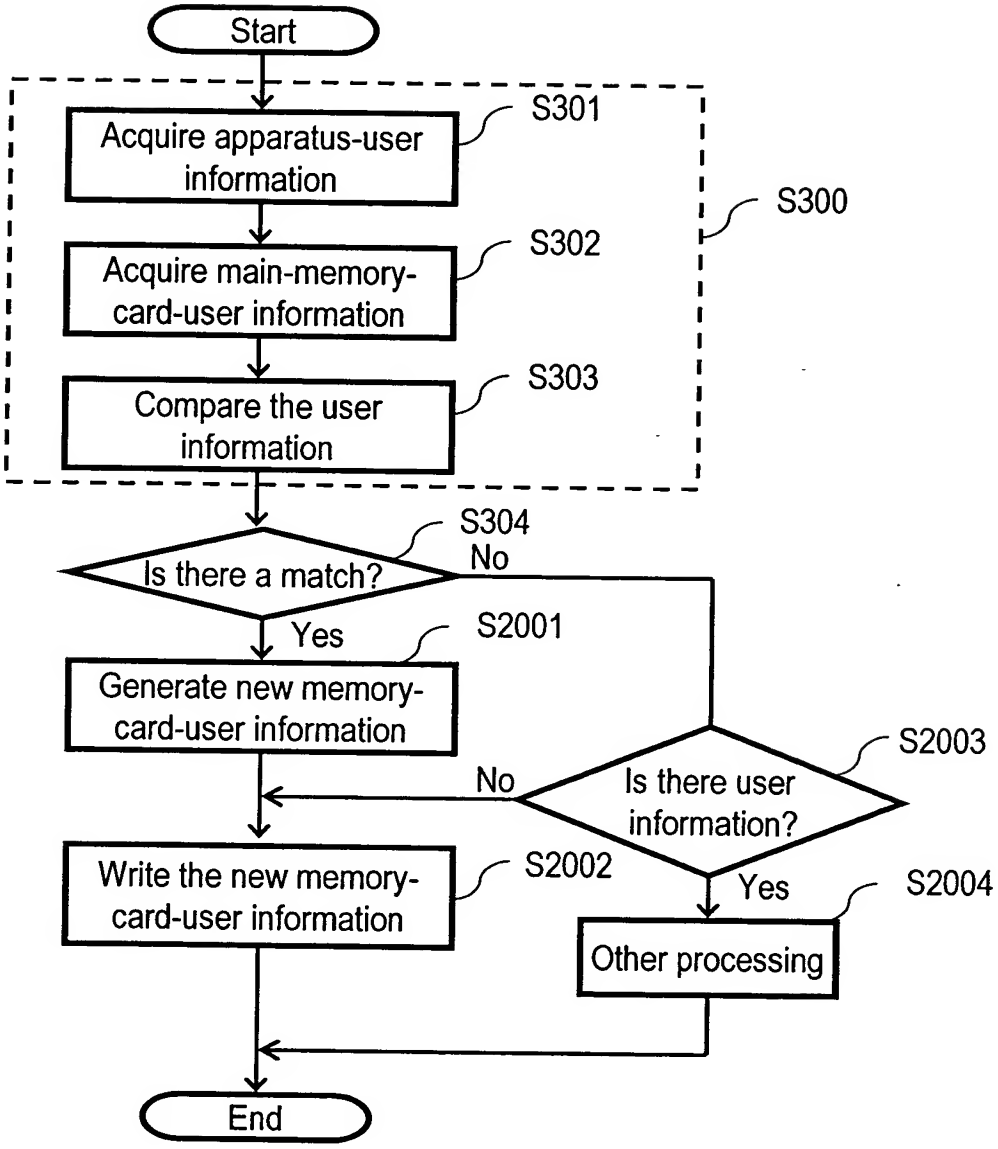

Start
S301
Acquire apparatus-user information
S300
S302
Acquire main-memory-card-user information
S303
Compare the user information
S304
Is there a match?
No
Yes
S2001
Generate new memory-card-user information
S2003
No
Is there user information?
Write the new memory-card-user information
S2002
Yes
S2004
Other processing
End

Fig. 21

Display example

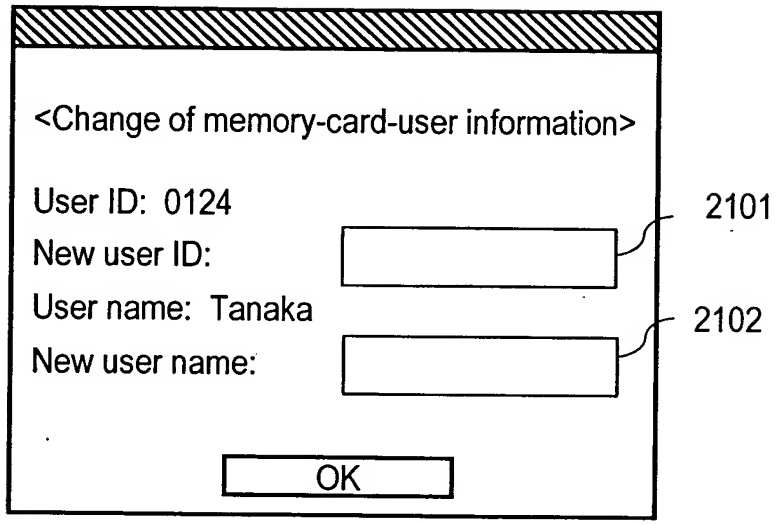


Fig. 22

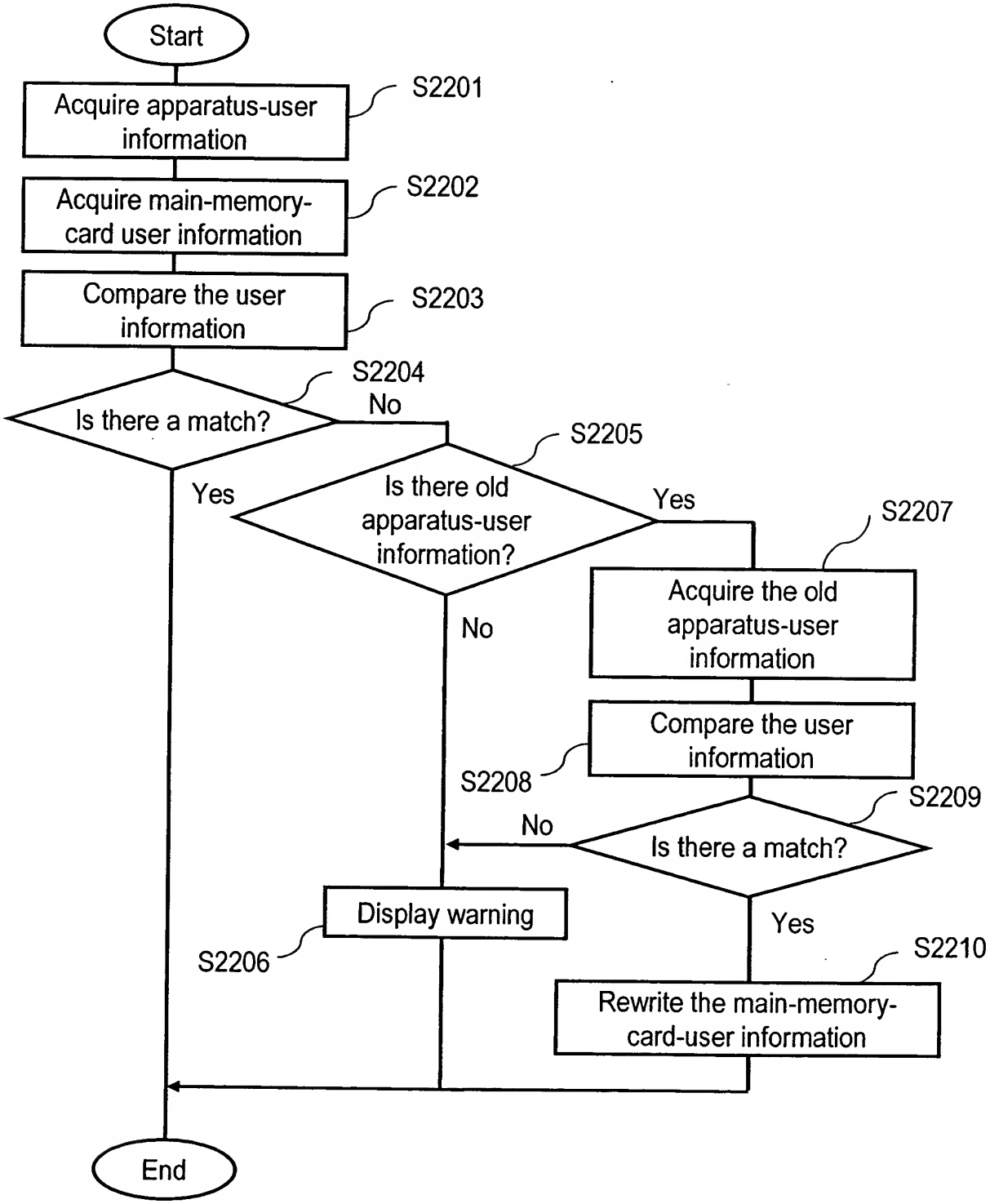

Start
Acquire apparatus-user information
S2201
Acquire main-memory-card user information
S2202
Compare the user information
S2203
Is there a match?
S2204
No
Yes
Is there old apparatus-user information?
S2205
Yes
No
Acquire the old apparatus-user information
S2207
Compare the user information
S2208
Is there a match?
S2209
No
Yes
Display warning
S2206
Rewrite the main-memory-card-user information
S2210
End

Fig. 23

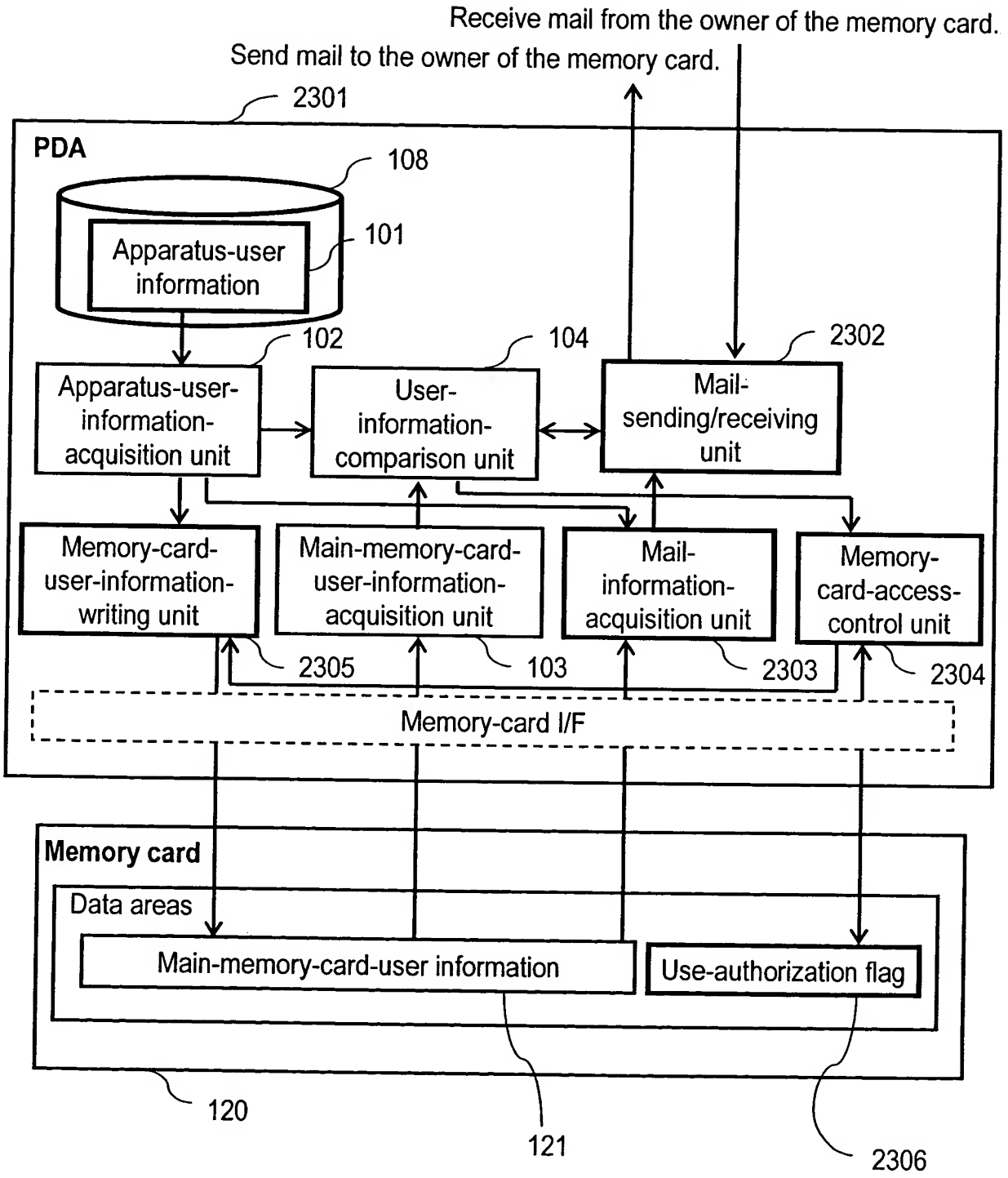

Receive mail from the owner of the memory card.
Send mail to the owner of the memory card.
2301
PDA
108
101
Apparatus-user information
102
104
2302
Apparatus-user-information-acquisition unit
User-information-comparison unit
Mail-sending/receiving unit
Memory-card-user-information-writing unit
Main-memory-card-user-information-acquisition unit
Mail-information-acquisition unit
Memory-card-access-control unit
2305
103
2303
2304
Memory-card I/F
Memory card
Data areas
Main-memory-card-user information
Use-authorization flag
120
121
2306

Fig. 24

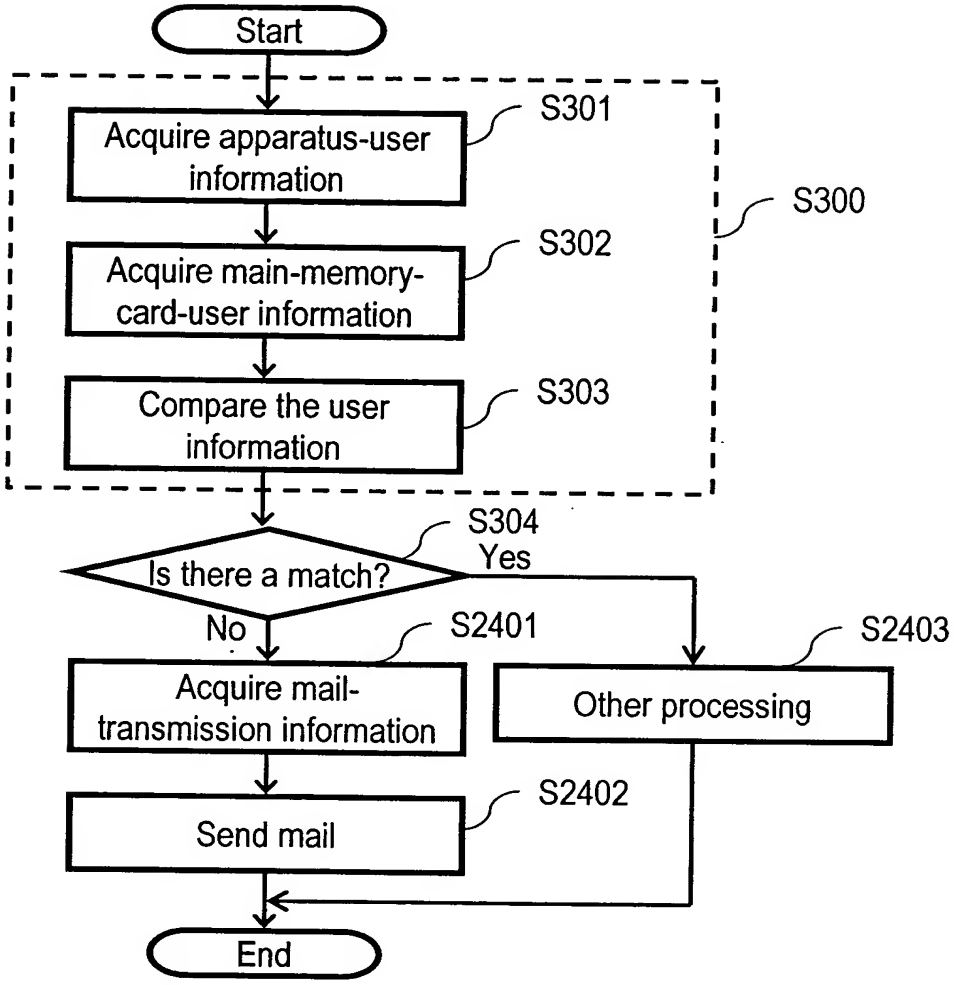

Start
Acquire apparatus-user information
S301
S300
Acquire main-memory-card-user information
S302
Compare the user information
S303
Is there a match?
S304
Yes
No
S2401
Acquire mail-transmission information
Send mail
S2402
Other processing
S2403
End

Fig. 25A

Mail-transmission information

2501

Data type	Byte(s)	
Mail address of source	64	2502
Mail address of destination	64	2503
Subject	64	2504
Date/time of use	128	2505
Apparatus-user name	64	2506
Address information	128	2507

Fig. 25B

Mail-transmission information

2511

Data type	Value
Mail address of source	"yamada@ saijo.xx.jp"
Mail address of destination	"tanaka@saijo.xx.jp"
Subject	"Memory-card-use information"
Date/time of use	"Mon 7 May 2002 15:06:44 +0900"
Apparatus-user name	"Yamada"
Address information	"1-1-1 Saijo, Hiroshima City"

Fig. 26

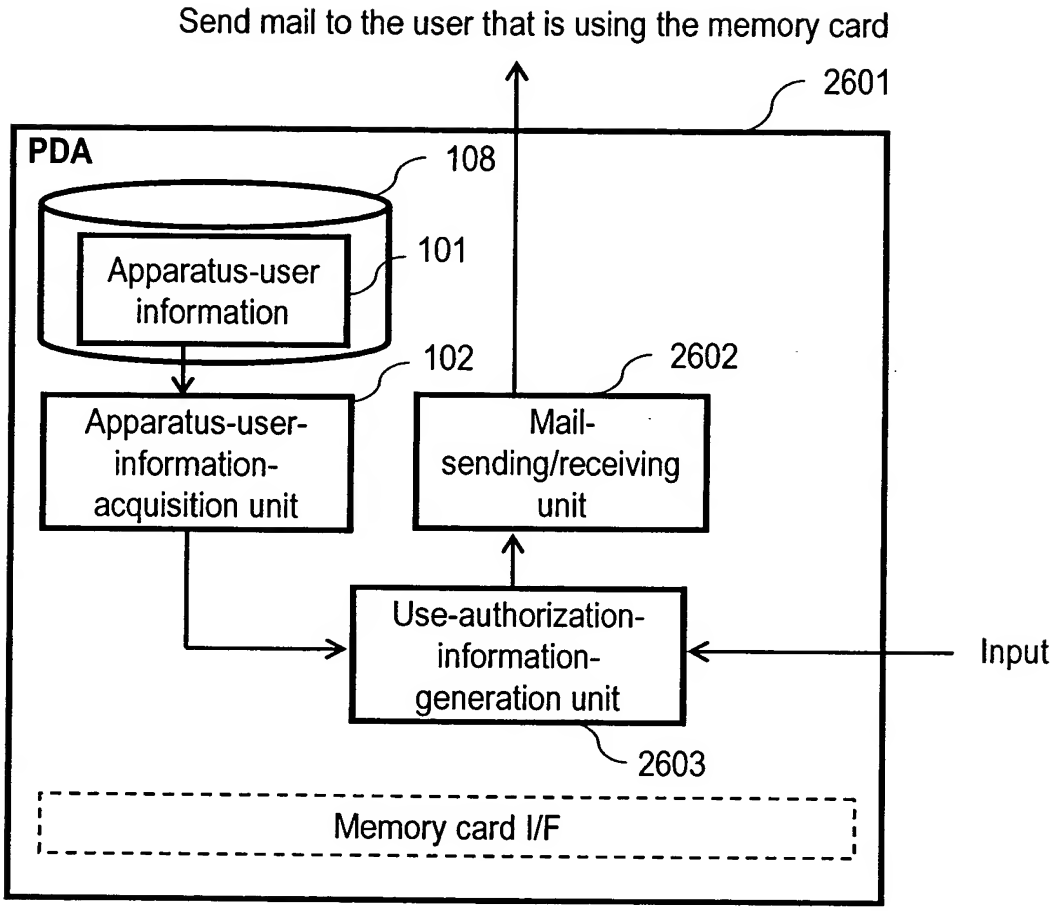

Send mail to the user that is using the memory card
2601
PDA
108
Apparatus-user information
101
102
2602
Apparatus-user-information-acquisition unit
Mail-sending/receiving unit
Use-authorization-information-generation unit
Input
2603
Memory card I/F

Fig. 27

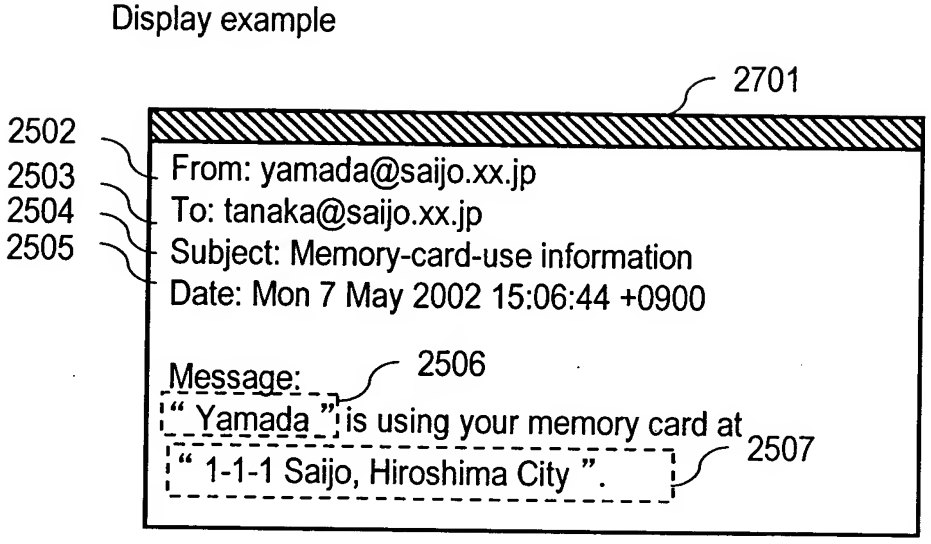

Display example
2701
2502
2503
2504
2505
From: yamada@saijo.xx.jp
To: tanaka@saijo.xx.jp
Subject: Memory-card-use information
Date: Mon 7 May 2002 15:06:44 +0900
Message:
2506
“ Yamada ” is using your memory card at
“ 1-1-1 Saijo, Hiroshima City ”.
2507

Fig. 28

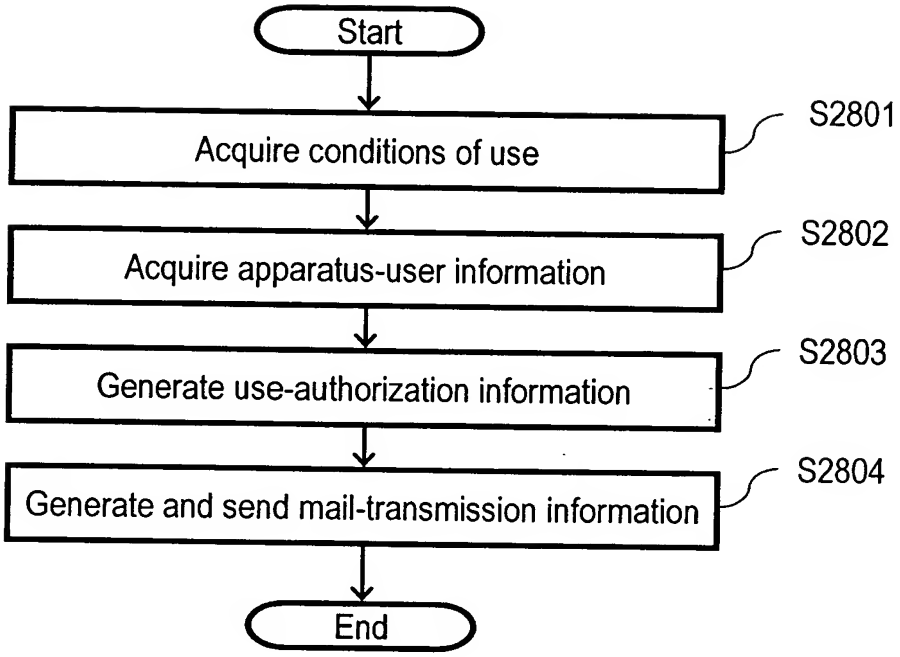

Start
Acquire conditions of use
S2801
Acquire apparatus-user information
S2802
Generate use-authorization information
S2803
Generate and send mail-transmission information
S2804
End

Fig. 29

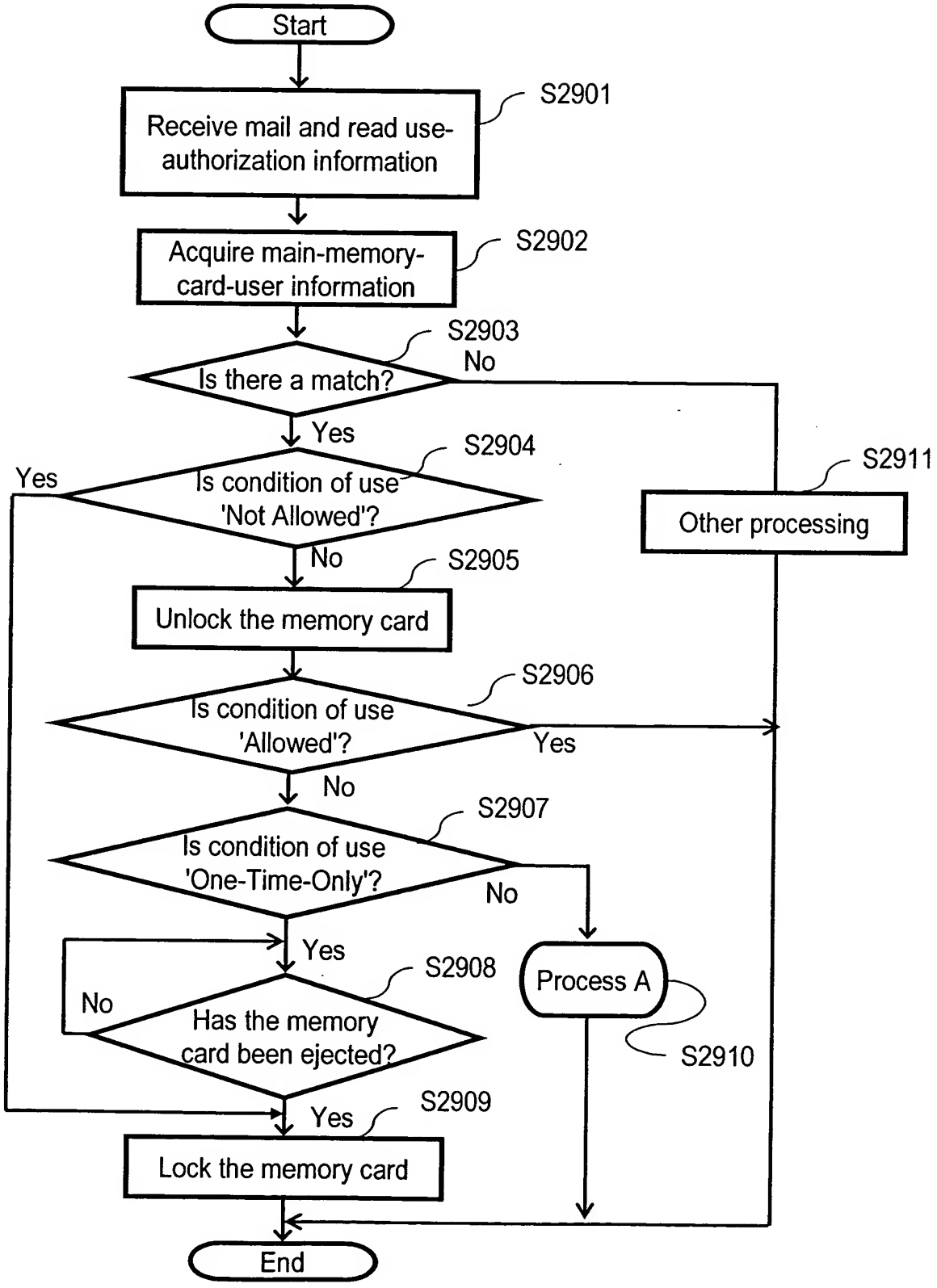

Start
Receive mail and read use-authorization information
S2901
Acquire main-memory-card-user information
S2902
Is there a match?
S2903
No
Yes
Is condition of use 'Not Allowed'?
S2904
Yes
No
Other processing
S2911
Unlock the memory card
S2905
Is condition of use 'Allowed'?
S2906
Yes
No
Is condition of use 'One-Time-Only'?
S2907
No
Yes
Has the memory card been ejected?
S2908
No
Process A
S2910
Yes
S2909
Lock the memory card
End

Fig. 30

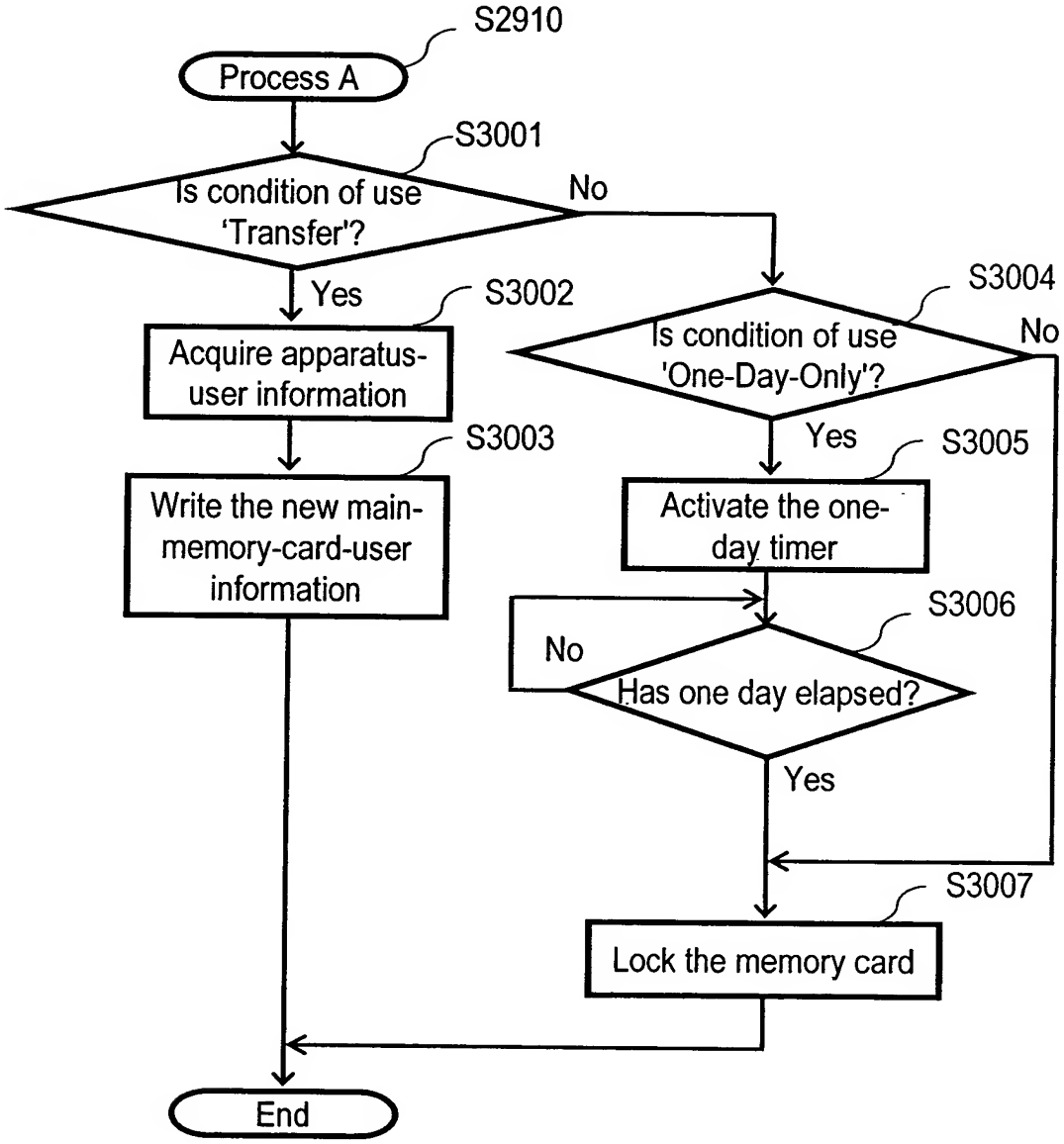

S2910
Process A
S3001
Is condition of use 'Transfer'?
No
Yes
S3002
Acquire apparatus-user information
S3003
Write the new main-memory-card-user information
S3004
Is condition of use 'One-Day-Only'?
No
Yes
S3005
Activate the one-day timer
S3006
No
Has one day elapsed?
Yes
S3007
Lock the memory card
End

Fig. 31A

Use-authorization information 3100

Data type	Byte(s)
User ID	4
User name	64
Condition of use	4

3101
3102
3103

Fig. 31B

Use-authorization information 3110

Data type	Value
User ID	0124
User name	"Tanaka"
Condition of use	3

Fig. 31C

Conditions of use

Data type	Byte(s)	Value	Explanation
Condition of use	1	0	Transfer
		1	One-day-only use allowed
		2	One-time-only use allowed
		3	Use not allowed
		4	Use allowed

Fig. 32A

Mail-transmission information

Data type	Byte(s)
Mail address of source	64
Mail address of destination	64
Subject	64
Date/time	128
Use-authorization information	72

3201
3202
3203
3204
3205
3100

Fig. 32B

Mail-transmission information

Data type	Value
Mail address of source	"tanaka@saijo.xx.jp"
Mail address of destination	"yamada@saijo.xx.jp"
Subject	"Memory card use authorization verification"
Date/time	"Mon 7 May 2002 15:06:44 +0900"
User ID	0124
Apparatus-user name	"Tanaka"
Condition of use	3

Use-authorization information

Fig. 33A

Display example

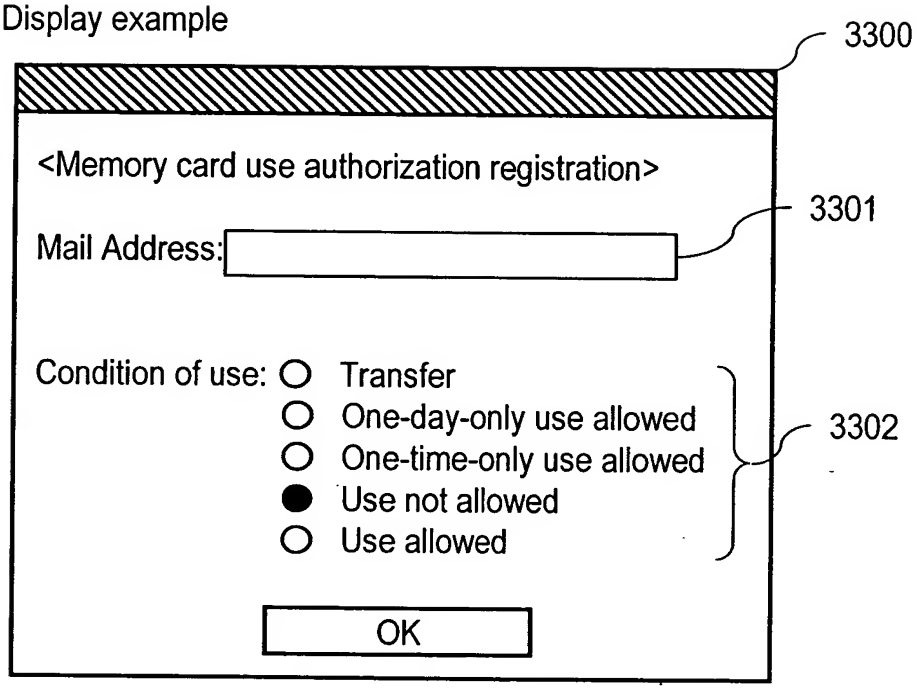
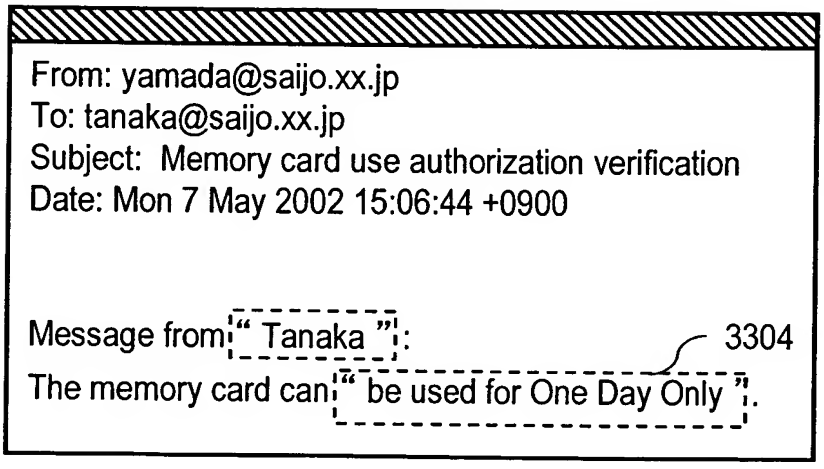


Fig. 33B

Display example